L13: Entry 37 of 55 File: DWPI Jul 24, 2007

DERWENT-ACC-NO: 2003-646305
DERWENT-WEEK: 200749

TITLE: New nucleic acid from Bacillus clausii, useful for improving recombinant protein production, encodes secretion, transcription or sporulation factors, also encoded proteins

INVENTOR: FERRARI, E; VAN KIMMENADE, A

PATENT-ASSIGNEE: GENENCOR INT INC (GEMV), GENENCOR INT (GEMV), FERRARI E (FERRI), VAN KIMMENADE A (VKIMI)

PRIORITY-DATA: 2002US-355258P (February 8, 2002), 2005US-0502667 (April 7, 2005)

Search Selected | Search ALL | Clear

PATENT-FAMILY:

	PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
☐	US 7247450 B2	July 24, 2007		000	C12P021/06
☐	WO 2003066818 A2	August 14, 2003	E	067	C12N000/00
☐	AU 2003215062 A1	September 2, 2003		000	C12N000/00
☐	EP 1487853 A2	December 22, 2004	E	000	C07H021/02
☐	JP 2005516613 W	June 9, 2005		045	C12N015/09
☐	US 20050209448 A1	September 22, 2005		000	C12Q001/68
☐	CN 1639183 A	July 13, 2005		000	C07H021/02

DESIGNATED-STATES: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS LU MC MW MZ NL OA PT SD SE SI SK SL SZ TR TZ UG ZM ZW AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
US 7247450B2	February 8, 2002	2002US-355258P	Provisional
US 7247450B2	February 6, 2003	2003WO-US03534	
US 7247450B2	April 7, 2005	2005US-0502667	
US 7247450B2		WO2003066818	Based on
WO2003066818A2	February 6, 2003	2003WO-US03534	
AU2003215062A1	February 6, 2003	2003AU-0215062	

DERWENT-ACC-NO: 2002-171720
DERWENT-WEEK: 200748

TITLE: New immunogenic reagent having a polypeptide of the full length Protective Antigen of Bacillus anthracis, useful for treating B. anthracis infection or in preparing a medicament for the prophylaxis or treatment of the infection

INVENTOR: BAILLIE, L W J ; BULLIFENT, H L ; FLICK-SMITH, H C ; HOLDEN, P T ; MILLER, J ; TITBALL, R W ; TOPPING, A W ; WALKER, N J ; WILLIAMSON, E D ; CLAIRE, F H ; DIANE, W E ; JAMES, B L W ; JANE, W N ; JULIE, M ; LISA, B H ; THOMSON, H P

PATENT-ASSIGNEE:

ASSIGNEE	CODE
UK SEC FOR DEFENCE	MINA
UK SEC FOR DEFENCE DSTL	MINA
BAILLIE L W J	BAILI
BULLIFENT H L	BULLI
FLICK-SMITH H C	FLICI
HOLDEN P T	HOLDI
MILLER J	MILLI
TITBALL R W	TITBI
TOPPING A W	TOPPI
WALKER N J	WALKI
WILLIAMSON E D	WILLI

PRIORITY-DATA: 2000GB-0016702 (July 8, 2000)

Search Selected | Search ALL | Clear

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
☐ EP 1808489 A1	July 18, 2007	E	000	C12N015/70
☐ WO 200204646 A1	January 17, 2002	E	040	C12N015/70
☐ AU 200169305 A	January 21, 2002		000	C12N015/70
☐ EP 1301606 A1	April 16, 2003	E	000	C12N015/70
☐ US 20030170263 A1	September 11, 2003		000	A61K039/02
☐ CN 1440459 A	September 3, 2003		000	C12N015/70
☐ JP 2004502460 W	January 29, 2004		064	C12N015/09
☐ ZA 200210206 A	May 26, 2004		060	C12N000/00
☐ IN 200300008 P3	March 4, 2005	E	000	C12N015/70
☐ RU 2270865 C2	February 27, 2006		000	C12N015/70

DESIGNATED-STATES: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
EP 1808489A1	July 6, 2001	2001EP-0947659	Div ex
EP 1808489A1	July 6, 2001	2007EP-0005671	
EP 1808489A1		EP 1301606	Div ex
WO 200204646A1	July 6, 2001	2001WO-GB03065	
AU 200169305A	July 6, 2001	2001AU-0069305	
AU 200169305A		WO 200204646	Based on
EP 1301606A1	July 6, 2001	2001EP-0947659	
EP 1301606A1	July 6, 2001	2001WO-GB03065	
EP 1301606A1		WO 200204646	Based on
US20030170263A1	July 6, 2001	2001WO-GB03065	
US20030170263A1	April 11, 2003	2003US-0332282	
CN 1440459A	July 6, 2001	2001CN-0812409	
JP2004502460W	July 6, 2001	2001WO-GB03065	
JP2004502460W	July 6, 2001	2002JP-0509500	
JP2004502460W		WO 200204646	Based on
ZA 200210206A	December 17, 2002	2002ZA-0010206	
IN 200300008P3	January 2, 2003	2003IN-MN00008	
IN 200300008P3		2001WO-GB03065	
RU 2270865C2	July 6, 2001	2001WO-GB03065	
RU 2270865C2	July 6, 2001	2003RU-0103779	
RU 2270865C2		WO 200204646	Based on

INT-CL (IPC): A61K 38/00; A61K 39/02; A61K 39/07; A61P 31/04; C07K 14/195; C07K 14/32; C12N 0/00; C12N 1/15; C12N 1/19; C12N 1/21; C12N 5/10; C12N 15/09; C12N 15/31; C12N 15/70; C12P 21/02

ABSTRACTED-PUB-NO: WO 200204646A
BASIC-ABSTRACT:

NOVELTY - An immunogenic reagent, which produces an immune response that is protective against Bacillus anthracis, is new. The reagent comprises one or more polypeptides which together represent up to three domains of the full length Protective Antigen (PA) of Bacillus anthracis or variants of these, and at least one of the domains comprises domain 1 or domain 4 of PA or its variant.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a nucleic acid encoding a polypeptide of the immunogenic reagent, or a 2228 base pair sequence (S1), fully defined in the specification or its modified form, which encodes PA or its variant that produces a protective immune response and which has at least 35 % GC content;

(2) an expression vector comprising the nucleic acid of (1);

EP1808489 A1 WO2004646

(3) a cell transformed with the vector of (2);

(4) a method for producing the immunogenic polypeptide which produces an immune response which is protective against B. anthracis;

(5) recombinant Escherichia coli cells which has been transformed with a nucleic acid which encodes the protective antigen (PA) or domain of B. anthracis or its variant that can produce a protective immune response, and where the percentage of guanidine and cytosine residues within the nucleic acid is in excess of 35 %; and

(6) a method of preventing or treating infection by B. anthracis by administering to a mammal the immunogenic reagent.

ACTIVITY - Antibacterial.

Animals were immunized on two occasions and their development of protective immunity was determined by challenge with spores of B. anthracis (STI strain). The data shows that a combination of all 4 domains of PA, whether presented as a fusion protein with glutathione-S-transferase (GST) or not, were protective up to a high challenge level. Removal of domain 4, leaving 1+2+3, resulted in breakthrough at the highest challenge level tested, 9x105. domains 1+2 were as protective as a combination of domains 1+2+3 at 9x104 spores. However, removal of domain 1a to leave a GST fusion with domains 1b+2, resulted in breakthrough in protection at the highest challenge level tested (9x104) which was only slightly improved by adding domain 3. The data indicates that the protective immunity induced by PA can be attributed to individual domains (intact domain 1 and domain 4) or to combinations.

MECHANISM OF ACTION - Vaccine.

USE - The immunogenic reagent is useful in the preparation of a medicament for the prophylaxis or treatment of B. anthracis infection.

CHOSEN-DRAWING: Dwg.0/5

TITLE-TERMS: NEW IMMUNOGENIC REAGENT POLYPEPTIDE FULL LENGTH PROTECT ANTIGEN BACILLUS USEFUL TREAT INFECT PREPARATION MEDICAMENT PROPHYLACTIC TREAT INFECT

DERWENT-CLASS: B04 D16

CPI-CODES: B04-B04C1; B04-C01G; B04-E03F; B04-E08; B04-F0100E; B04-F10A3E; B04-N03A0E; B14-A01B; B14-S11B; D05-C12; D05-H07; D05-H12A; D05-H12E; D05-H14; D05-H14A1; D05-H17A5;

CHEMICAL-CODES:

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     Chemical Indexing M1 *01*
    Fragmentation Code
    M423 M430 M710 M782 M905 N135 Q233
    Specfic Compounds
    A00NSQ A00NSM A00NSN

Chemical Indexing M1 *02*
    Fragmentation Code
    M423 M430 M710 M782 M905 N135 Q233
    Specfic Compounds
    A012PQ A012PM A012PN

Chemical Indexing M1 *03*
    Fragmentation Code
    M423 M430 M710 M782 M905 N135 Q233
    Specfic Compounds
    A00GTQ A00GTM A00GTN

Chemical Indexing M1 *04*
    Fragmentation Code
    M421 M423 M720 M905 N135 P220 Q233
    Specfic Compounds
    A00H1K A00H1T A00H1P

Chemical Indexing M1 *05*
    Fragmentation Code
    M421 M423 M720 M905 N135 P220 Q233
    Specfic Compounds
    A00H3K A00H3T A00H3P
```

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: C2002-053157

DOCUMENT-IDENTIFIER: US 5726042 A
TITLE: Expression of heterologous proteins in Bacillus megaterium utilizing sporulation promoters of Bacillus subtilis

CLAIMS:

1. A method of expressing a heterologous HIV protein in recoverable form in Bacillus megaterium, said method comprising the steps of:

(a) introducing into Bacillus megaterium a DNA sequence including the spoVG sporulation promoter of Bacillus subtilis, and a structural gene encoding said heterologous HIV protein under the control of said spoVG promoter, wherein said structural gene encodes an HIV-1 gp41 protein or fragments thereof which are capable of reacting with antibodies to said HIV-1 gp41 protein;

(b) culturing said Bacillus megaterium under conditions in which said structural gene is expressed from said spoVG promoter; and

(c) recovering said heterologous HIV protein from said Bacillus megaterium.

DOCUMENT-IDENTIFIER: US 6541001 B1
TITLE: Vaccine composition and method of using the same

CLAIMS:

23. The immunogenic composition of claim 18, wherein the antigenic component is selected from the group consisting of: anthrax spores, Salmonella SPP, E. coli, and an admixture of one or more of the forgoing, whether naturally occurring or recombinant or modified.

DOCUMENT-IDENTIFIER: US 6280721 B1
TITLE: Production of Bacillus thuringiensis integrants

CLAIMS:

1. An integrant of Bacillus thuringiensis or spore thereof which produces at least one heterologous crystal delta-endotoxin, wherein said heterologous crystal endotoxin is produced from a homologously recombined gene in said integrant's chromosome, and wherein said integrant has greater pesticidal activity than a corresponding parental strain by producing a larger quantity of a crystal delta-endotoxin as compared to said corresponding parental strain.

51. EP 433945A. Bacillus thuringiensis kurstaki transformants - contg. deoxyribonucleic acid expressing mutant endotoxin genes, used as insecticides. BEERMAN, N D, et al. A01N063/00 A01N063/02 C12N000/00 C12N001/20 C12N001/21 C12N013/00 C12N015/00 C12N015/32 C12N015/87.

☐ 52. FR 2639959A. New recombinant Bacillus bacteria with larvicidal activity - producing native toxin and B. sphaericus toxic protein expressed from inserted DNA. BOURGOUIN, C, et al. A01N063/00 C12N015/32.

☐ 53. EP 366397A. Bacillus thuringiensis isolate BT PS81F - and gene encoding toxin, active against lepidoptera insects. PAYNE, J, et al. A01N063/00 A01N063/02 C07K014/325 C12N001/20 C12N001/21 C12N015/09 C12N015/32 C12N015/33 C12P021/02 C12N001/20 C12R001:07 C12N001/21 C12R001:19 C12N015/09 C12R001:07.

☐ 54. WO 8907605A. Bacillus turingiensis var israelensis cry D toxin gene and proteins - used for producing insecticide compsns. active against Dipteran species. DONOVAN, W P. A01N063/00 C07H015/12 C07K013/00 C12P021/00 C12R001/07.

☐ 55. DE 3874608G. Mutant strains of Bacillus thuringiensis - used as bio-control agents against lepidopteran insects, esp. cabbage looper and imported cabbage-worm. MARTIN, P A W, et al. A01N063/00 C12N001/20 C12N003/00 C12N007/00 C12N015/00 C12P001/04 C12P021/00 C12R001/07 C12P001/04 C12R001:07.

L1: Entry 21 of 34 File: USPT Dec 28, 2004

DOCUMENT-IDENTIFIER: US 6835820 B2
TITLE: Polyhydroxyalkanoate biosynthesis associated proteins and coding region in bacillus megaterium

Detailed Description Text (204):
The following references, to the extent that they provide exemplary procedural or other details supplementary to those set forth herein, are specifically incorporated herein by reference. 1. Altschul, S. F., T. L. Madden, A. A. Schaffer, J. Zhang, Z. Zhang, W. Miller, and D. J. Lipman. 1997. Gapped BLAST and PSI BLAST: a new generation of protein database search programs. Nucleic Acids Res., 25: 3389-3402. 2. Anderson, A. and E. A. Dawes. 1990. Occurrence, metabolism, metabolic role, and industrial uses of bacterial polyhydroxyalkanoates. Microbiol Rev., 54: 450-472. 3. Cevallos, M. A., S. Encarnacion, A. Leija, Y. Mora, and J. Mora. 1996. Genetic and physiological characterization of a Rhizobium etli mutant strain unable to synthesize poly-beta-hydroxybutyrate. J. Bacteriol., 178: 1646-1654. 4. Connors, M. J., J. M. Mason, and P. Setlow. 1986. Cloning and nucleotide sequencing of genes for three small, acid soluble proteins Bacillus subtilis spores. J. Bacteriol., 166: 417-425. 5. deSmet, M. J., G. Eggink, B. Witholt, J. Kingma, and H. Wynberg. 1983. Characterization of intracellular inclusions formed by Pseudomonas oleovorans during growth on octane. J. Bacteriol., 154: 870-878. 6. Dunlop, W. and A. W. Robards. 1973. Ultrastructural study of poly-.beta.-hydroxybutyrate granules from Bacillus cereus. J Bacteriol., 114: 1271-1280. 7. Eggink, G., P. de Waard, and G. N. M. Huijberts. 1992. The role of fatty acid biosynthesis and degradation in the supply of substrates for poly(3-hydroxyalkanoate) formation in Pseudomonas putida. FEMS Microbiol. Rev., 103: 159-164. 8. Ellar, D., D. G. Lundgren, K. Okamura, and R. H. Marchessault. 1968. Morphology of poly-.beta.-hydroxybutyrate granules. J. Mol. Biol., 35: 489-502. 9. Fliss, E. R., A. C. Loshon, and P. Setlow. 1986. Genes for Bacillus megaterium small, acid-soluble spore proteins: Cloning and nucleotide sequence of three additional genes from this multigene family. J. Bacteriol., 165: 467-473. 10. Fliss, E. R. and P. Setlow. 1984. Bacillus megaterium spore protein C-3: nucleotide sequence of its gene and the amino acid sequence at its spore cleavage site. Gene, 30: 167-172. 11. Fuller, R. C., J. P. O'Donnell, J Saulnier, T. E. Redlinger, J. Foster, and R. W. Lenz. 1992. The supramolecular architecture of the polyhydroxyalkanoate inclusions in Pseudomonas oleovorans. FEMS Microbiol. Rev., 103: 279-288. 12. Gemgross, T. U., P. Reilly, J. Stubbe, A. J. Sinskey, and O. P. Peoples. 1993. Immunocytochemical analysis of poly-.beta.-hydroxybutyrate (PHB) synthase enzyme at the surface of PHB granules. J. Bacteriol., 175: 5289-5293. 13. Gilman, M. Z., J. L. Wings, and M. J. Chamberlin. 1981 Nucleotide sequence of two Bacillus subtilis promoters used by Bacillus subtilis sigma-28 RNA polymerase. Nucleic Acids Res., 9: 5991-6000. 14. Gitt, M. A., L. F. Wang, and R. H. Doi. 1985. A strong sequence homology exists between RNA polymerase sigma factors of Bacillus subtilis and Escherichia coli. J. Biol. Chem., 260: 7178-7185. 15. Griebel, R., Z. Smith, and M. Merrick. 1968. Metabolism of poly-.beta.-hydroxybutyrate. 1. Purification, composition, and properties of native poly-.beta.-hydroxyburyrate granules from Bacillus megaterium. Biochem., 7: 3676-3681. 16. Haima, P., D. van Sinderen, H. Scholting, S. Bron, and G. Venema. 1990. Development of .beta.-galactosidase .alpha.-complementation system for molecular cloning in Bacillus subtilis. Gene, 86: 63-69. 17. Haywood, G. W., A. J. Anderson, L. Chu, and E. A. Dawes. 1988. The role of NADH- and NADPH-linked acetoacetyl-CoA reductases in the poly-3-hydroxybutyrate synthesizing organism Alcaligenes

In another aspect, the invention provides methods for enhancing an immune response to an immunogenic polypeptide (e.g., antigen) or an expression vector encoding the immunogenic polypeptide in a subject, the method comprising administering to the subject a population of spores and an expression vector comprising a nucleotide sequence encoding the immunogenic polypeptide, wherein the immune response is enhanced compared to the immune response generated by administration of the expression vector or encoded immunogenic polypeptide alone to the subject. The amount of the spore system or encoded polypeptide that is administered that is effective to enhance the immune response.

In yet another aspect, the invention includes compositions comprising a spore system that comprises a spore and at least one peptide, polypeptide, protein, carbohydrate, or nucleotide sequence having anti-pathogenic activity displayed on, bound to, or contained within the spore.

Also included are compositions comprising a spore system that comprises a non-viable spore and at least one exogenous nucleic acid, protein, peptide, or polypeptide displayed on, bound to, or contained within the spore. In addition, the invention provides compositions comprising a spore system that comprises a spore and at least one exogenous nucleic acid binding particle displayed on or bound to the spore.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a diagram of steps involved in an exemplary screening and selection of spore systems.

Figure 2 is a diagram of the steps involved in developing an exemplary recombinant library and screening by an *in vitro* assay. A library of recombinant nucleotide sequences of interest can be generated by shuffling or other methods of generating diversity known to one of skill in the art and discussed elsewhere herein. The library of recombinant molecules is then transformed into a population of cells capable of sporulation. The transformed cells are induced to sporulate, generating a population of spores displaying the peptides, polypeptides, or proteins encoded by the recombinant library. In one embodiment the spores display multiple copies of the same polypeptide. In another embodiment, the spores contain more than one